Name of Organization: USFWS, Alpena Fishery Resources Office

Type of Organization: Federal Agency

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Project Title: Evaluation of lake sturgeon spawning reef in St. Clair River

Project Category: Habitat (Ecological) Protection and Rest

Rank by Organization (if applicable): 1

Total Funding Requested ($): 219,900 **Project Duration:** 2 Years

Abstract:

This project will investigate a spawning population of lake sturgeon utilizing the only known spawning reef in close proximity to US waters of Lake Huron at the mouth of the St. Clair River and determine their home range. All Lake Huron tributaries known to have historically supported lake sturgeon recruitment have been blocked by the construction of dams, effectively preventing free-ranging lake sturgeon from accessing spawning grounds. A deep-water reef at the confluence of Lake Huron and the St. Clair River has recently been shown to attract a spawning population of lake sturgeon. The origin and distribution of these adults and their resulting progeny is unknown. Personnel from the US Fish and Wildlife Service Alpena FRO (Service), in cooperation with state, provincial, federal, university and NGO partners, will capture spawning lake sturgeon at this site, implant ultra-sonic tags and track the distribution of those fish following spawning. Information gathered will provide essential data required to guide future habitat protection, enhancement, and restoration activities, as well as lake sturgeon recovery plans in this and other Great Lakes locations with similar habitat. This demonstration effort will be a crucial first step in determining the present and potential contribution of St. Clair River lake sturgeon to adjacent populations in Lakes Huron, St. Clair and Erie. Additionally this effort will assist in the recovery of sturgeon from "Threatened" status. This work will compliment previous work funded by US EPA GLNPO on the Detroit River. Funding of this project will allow the Service to participate in and expedite the LaMP process including on the ground restoration actions. The work will be done in support of LaMP, SOLEC, and AOC initiatives. Without this funding, the Service will not be able to address this important demonstration project that has application to the entire Great Lakes Basin.

Geographic Areas Affected by the Project

States:

- [ ] Illinois
- [ ] Indiana
- [x] Michigan
- [ ] Minnesota
- [ ] New York
- [ ] Pennsylvania
- [ ] Wisconsin
- [ ] Ohio

Lakes:

- [ ] Superior
- [ ] Huron
- [ ] Michigan
- [ ] Erie
- [ ] Ontario
- [x] All Lakes

Geographic Initiatives:

- [ ] Greater Chicago
- [ ] NE Ohio
- [ ] NW Indiana
- [ ] SE Michigan
- [ ] Lake St. Clair

Primary Affected Area of Concern: St. Clair River, MI

Other Affected Areas of Concern: Clinton, River MI, Detroit River, MI, Saginaw River, MI, St. Marys River, MI

For Habitat Projects Only:

Primary Affected Biodiversity Investment Area: Lake St. Clair/Detroit River

Other Affected Biodiversity Investment Areas:

Problem Statement:

Over-exploitation and habitat loss, degradation and fragmentation have contributed to depletion of lake sturgeon to levels requiring listing as Threatened by 19 of 20 states in its original range. They are identified as a species of special concern by the Service and are recognized as "globally rare" Great Lakes fish species (The Nature Conservancy 1994). Remnant, free-ranging, riverine spawning populations of Great Lakes lake sturgeon are now known to exist in only a few tributaries to southern Lake Superior, the St. Clair River and the St. Lawrence River. Recent discovery of a deep-water reef at the confluence of Lake Huron and the St. Clair River has been shown to attract a spawning population of lake sturgeon. All Lake Huron tributaries known to have historically supported lake sturgeon recruitment have been blocked by the construction of dams, effectively preventing free-ranging lake sturgeon from accessing spawning grounds. Therefore, this site may represent the only known lake sturgeon-spawning reef in U.S. waters of Lake Huron. The origin and distribution of lake sturgeon utilizing this reef is unknown. The International Joint Commission has documented extensive environmental and habitat perturbations in the St. Clair River, prompting its listing as an Area of Concern (AOC). In addition, the study area is identified by The Nature Conservancy as supporting significant biodiversity, and has biological importance on a regional and global scale. Use of lake sturgeon as an indicator species for monitoring ecosystem health and efforts to remediate past habitat damages is a logical choice. This project will provide valuable information towards efforts to protect, enhance, and restore fish and wildlife habitats and diversity in this connecting waterway.

Proposed Work Outcome:

The proposed scope of this study is to gather preliminary information on the current status of lakes sturgeon utilizing a deep-water spawning reef at the confluence of Lake Huron and the St. Clair River and determine the origin of these sturgeon and waters benefiting from recruitment of their progeny. Data will be sought on both adult and juvenile lake sturgeon utilizing this spawning reef. Similar studies of spawning lake sturgeon populations have been initiated in the lower reaches of the St. Clair River and in the Detroit River. These studies will serve both as guides for the technologies employed and to provide a means of comparison to evaluate the current condition of habitat.

The proposed scope of this study, beginning in Spring 2001, is to gather preliminary information on the origin, abundance, habitat use, and factors limiting spawning success (recruitment) of adult lake sturgeon in the upper reach of the St. Clair River. Data collected in this project will provide much of the basic information needed by the Michigan Department of Natural Resources Lake Sturgeon Rehabilitation Strategy. It will also be useful for Ontario Ministry of Natural Resources and other Fish and Wildlife Service Offices in their current efforts to rehabilitate lake sturgeon populations in Great Lakes.

The basic design of the proposed project will rely on the capture of adult lake sturgeon during their spring spawning

migrations into the St. Clair River. Although the timing of spawning migrations is somewhat variable, adult lake sturgeon usually begin entering the St. Clair River in late May or early June. Spawning activity peaks in early to mid June, with most adults leaving the river by late-June (Lashbrook, Per. comm.). Recent recreational SCUBA diver video has documented significant lake sturgeon spawning activity in the upper reach of the river, however, origin of these lake sturgeon is unknown.

Each year of the study we will monitor the movements of adult fish during their spawning migrations by attaching a sonic transmitter to each of the first 10 adults captured (5 males and 5 females, if possible). As the sonic-tagged fish depart from the river following spawning, their locations will be monitored daily using a portable hydrophone and sonic receiver. Each transmitter has a unique preset signal that employs a different frequency and beep-sequence to distinguish it from other sonic-tagged fish in the vicinity. Under optimal conditions transmitters can be detected at a distance of approximately 1-mile. Exact locations of sonic-tagged fish will be recorded using a hand-held GPS receiver. After an exact position fix of the sturgeon has been obtained, the tracking crew will measure several habitat attributes, including water temp, depth, velocity, and substrate type.

Locations of individual fish will be closely monitored during their spawning migrations to determine where the fish are spending the majority of their time and for how long. At the conclusion of the study a complete history of the spatial and temporal movements of each fish will be compiled for comparison with the other tagged fish. The migratory profile of each fish's locations and movements will help identify reaches of the river or lower Lake Huron that contain critical habitats such as staging, resting, or spawning grounds. These types of habitats have not been documented for lake sturgeon populations in the Great Lakes, but are widely recognized as essential components of sturgeon spawning habitat in other systems (Bain 1997). By identifying where these critical habitats occur, this portion of the study will help improve management strategies designed to protect and enhance critical riverine and lake habitats for spawning lake sturgeon.

The importance of identifying existing critical habitats for spawning lake sturgeon cannot be overstated. Because all historic lake sturgeon spawning tributaries have been blocked on Lake Huron, this site in the upper St. Clair River is potentially the only sturgeon spawning site in U.S. waters of Lake Huron. In the past 100 years, human influences have nearly eradicated most Great Lakes sturgeon populations. Development of an effective rehabilitation strategy will first require a thorough knowledge of the links between habitat and life history that limit reproductive output of the remaining population. This portion of the study will help answer questions regarding where, when, how, and for how long the adults use the river for spawning.

To provide assistance for on-going genetic research on existing populations of lake sturgeon, tissue samples will be collected from all captured lake sturgeon utilizing procedures outlined by US FWS Great Lakes Basin Ecosystem Team Lake Sturgeon Subcommittee. The committee identified, at a December 1999 workshop, that collection of genetic material from known lake sturgeon spawning populations was priority one. This study will provide the first genetic samples from this newly discovered spawning site. There is need to evaluate remnant lake sturgeon, in regard to contaminant loads, to determine potential impacts on reproductive capability and ecosystem effects relating to fish passage. Due to the depleted nature of the stocks, only non-lethal sampling is prudent. An attempt will be made to collect egg samples from sexually mature, ripe-running lake sturgeon captured during the sampling period. Surgery to implant sonic tags will also provide an opportunity to collect eggs. Each egg mass sample will be transferred to chemically clean 8 oz. Glass containers and frozen. Samples will be analyzed for organochlorine pesticids and PCBs, total mercury, percent lipid and percent moisture.

Based on data collected through this project, we hope to better define the current status of lake sturgeon populations in Lake Huron and the St. Clair River, and provide guidance to agencies and organizations interested in protecting and restoring fish and wildlife habitat in the Great Lakes Ecosystem. This guidance may lead to methods to integrate economic growth with conservation. Development of recovery plans for lake sturgeon and effective stewardship of this critical Great Lakes waterway will not be possible without this information.

If adequate numbers of adult lake sturgeon can be captured through this demonstration of sampling protocol, subsequent studies can be initiated to determine the relationship between Lake Huron lake sturgeon and populations in Lake St. Clair, Detroit River and Lake Erie. This project has the potential to test new biological management practices and restoration techniques, and will provide a demonstration with reportable environmental results.

Project Milestones:	Dates:
Project Start	10/2000
Literature Review/Gear Preparation	03/2001
Lake Sturgeon Sampling	05/2001
Lake Sturgeon Tracking	06/2001
Lake Sturgeon Sampling	05/2002
Lake Sturgeon Tracking	06/2002
Data Analysis/Report Preparation	12/2002
Project End	12/2002

☒ Project Addresses Environmental Justice

If So, Description of How:

This dynamic and historically significant ecosystem is situated in a large urban region of the Great Lakes and provides aesthetic and recreational value to a culturally diverse populace. The value of preserving and restoring the ecological integrity of the system is supported by a wide diversity of interests. Restoring this is essential to the long-term health of the Great Lakes ecosystem, and to current and future generations of people who reside in the area. In conformance with Executive Order 12898 of February 11, 1994, the health and welfare of minority and low-income populations of people, such as Native Americans, will be safe-guarded by quickly sharing the results of our study with legal representatives of Bi-national organizations, such as the American Indian Health Services, the North American Indian Association of Detroit, and Walppole Indian Tribe.

☒ Project Addresses Education/Outreach

If So, Description of How:

The study will be part of a large international, inter-basin, multi-agency effort to expand the knowledge base regarding free-ranging Great Lakes lake sturgeon populations (www.fws.gov/r3pao/sturgeon). Numerous outreach efforts, including written reports, media coverage, Internet web sites, and public presentations are components of the effort and will be utilized for this project. Result of this study will be summarized, presented at future fisheries symposia/meetings, posted on the Internet, and submitted for peer reviewed publication.

Project Budget:

	Federal Share Requested ($)	Applicant's Share ($)
Personnel:	120,000	200,000
Fringe:	4,400	0
Travel:	10,000	0
Equipment:	14,800	12,000
Supplies:	31,000	20,000
Contracts:	0	0
Construction:	0	0
Other:	0	0
Total Direct Costs:	180,200	232,000
Indirect Costs:	39,700	0
Total:	219,900	232,000
Projected Income:	0	0

Funding by Other Organizations (Names, Amounts, Description of Commitments):

Purdies Fisheries, $20,000, In-kind services in the form of vessel use for capturing lake sturgeon and facilities for conducting transmitter surgery

Michigan Department of Natural Resources, $6,000, In-kind services in the form of vessel use and personnel for tracking lake sturgeon

U.S. Coast Guard Port Huron Station, $15,000, In-kind services in the form of housing and boat slip for sampling and tracking crews

Central Michigan University, $25,000, In-kind services in the form of a Graduate Research assistant to assist with the project

Ontario Ministry of Natural Resources-Lake Huron Management Unit, $15,000, In-kind services in the form of lake sturgeon tagging and commercial by-catch monitoring in Southern Lake Huron

11 Lake Huron Commercial Fishers, $200,000, In-kind services in the form of recapturing tagged lake sturgeon from this project (Barbeaux Fishery, Bay Port Fish Company, Beardsley Fish Company, Beers Fishery, Cedarville Fish Company, Gauthier-Spaulding Fishery, Lentz Fishery, M&W Fish Company, Serafin Fishery, and Whytes Fishery)

US Geological Survey Biological Resources Division, $12,000, In-kind service in the form of contaminant analysis on egg masses

US Geological Survey Biological Resources Division, $15,000, In-kind service in the form of habitat mapping of the spawning reef

Description of Collaboration/Community Based Support:

This demonstration proposal has already received the enthusiastic support of and been included in the goals of the Greater Detroit American Heritage Rivers Initiative, the Binational St. Clair River and Detroit River Remedial Action Planning Teams, the City of Port Huron Department of Parks and Recreation, US Coast Guard Port Huron Station, and local, state and federal elected representatives. The effort will be closely coordinated with the St. Clair and Detroit River RAPs, USEPA's SEMI, and the Lake Erie LaMP and Lake Huron Initiative and the SOLEC initiative. Likewise, detailed unpublished fishery information essential to the successful conduct of this study and offers to collaborate on the conduct of the study have been received from private citizens. Goals and objectives of this demonstration project have been shared with state and federal permitting agencies, local law enforcement personnel, and participants in two e-mail networks (1) Central Great Lakes Bi-national Lake Sturgeon Group, and (2) US Fish and Wildlife Service Great Lakes Basin Ecosystem Team.

Support for and interest in the demonstration has already been expressed by numerous scientific and management organizations, such as the Great Lakes Fishery Commission, the Michigan Department of Natural Resources, US Geological Survey Biological Resources Division, and the Ontario Ministry of Natural Resources, media representatives, including the Detroit Free Press and the Outdoor Writers Association of America